peer, unblinded review. The rates of HAHO-CDI decreased from a cumulative of 73 per 10.000 patient-days to a rate of 23.8 per 10.000 patient-days, with no new cases during the last month of surveillance.

Conclusion: A multidisciplinary approach to decrease rates of CDI including: education, enhanced environmental cleaning with review and feedback, and standard use of UVC pulsed technology was effective to reduce the rates of CDI in a bone marrow transplant unit.

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Tbo or Not Tbo-That Is the Question!

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Growth factors are routinely used after autologous transplantation to shorten the duration of neutropenia. Tbo-filgrastim (TBO) was recently approved in the U.S. for patients with non-myeloid malignancies. The Average Wholesale Price for TBO is 20% less than Filgrastim (FGS). Whether TBO is comparable to FGS for reducing time to engraftment following HSCT is unknown. A cost-savings initiative was undertaken at Northwestern Memorial Hospital to substitute TBO for FGS in all autografts. Herein are the results of an observational study which compares TBO and FGS. FGS patients were treated from10/2013-4/14/2014 and TBO patients between 4/15/14-9/20/2014. All patients were treated for multiple myeloma with melphalan 200mg/m2. TBO and FGS were initiated day+5 after stem cell infusion, and discontinued the first day the absolute neutrophil exceeded 1000/ml. Time to engraftment was defined as the number of days from stem cell re-infusion until the first day the ANC exceeded 500cell/ml. TBO and FGS dose was rounded as follows: <80kg received 300mcg/day, >80mg<120kg received 480mcg and those >120kg received 600mcg/day.

96 consecutively treated patients were included-48 treated with TBO and 48 treated with FGS. No significant difference was observed for diagnosis, age, gender, weight, BSA, growth factor dose or dose/kg, number of stem cells infused, number of patients who developed febrile neutropenia or microbiologically proven infection or prolonged fever (>48 hours). Median time to engraftment and delayed engraftment (>14days) was significantly longer in the TBO-treated patients. There was no difference in overall length of stay or hospital mortality.

TBO-filgastrim appears to be effective in reducing the time of neutropenia and stem cell engraftment. However delayed engraftment, especially as observed >14 days after stem cell infusion, was observed significantly more often in TBO treated patients compared to those treated with FGS. These results require confirmation through a large randomized trial.

Table 1
Filgrastim versus TBO-filgrastim

Characteristic (median/range)	Filgrastim	TBO-Filgastim	P-value
Number	48	48	
Age	57(42-69)	59(38-69)	0.9299
Gender (male/%)	27(56)	30(52)	0.8395
Weight (kg)	76(47-120)	84(50-160)	0.1227
Body surface area (adjusted)	1.8(1.45-2.2)	1.8(1.45-2.25)	0.8755
Melphalan dose (mg)	365(290-440)	365(290-45)	0.99
G-CSF dose(mcg/kg)	389(300-600)	413(300-600)	0.2584
Number of CD34 stem cell infused (million/kg)	6.57(2.97-20.9)	7.04(3.6-19.1)	0.4621
Documented infection (%)	6(12.5)	3(6)	0.468
Febrile neutropenia (%)	27(56)	20(41)	0.2204
Time to engraftment (days)	12(9-23)	13 (10-26)	0.0338
Engraftment > 14days (%)	8(17)	16(33)	0.0521
Total number of G-CSF doses (mean/days)	9.42(6-24)	9.8(5-24)	0.5109
Length of stay(days)	16(13-51)	16(12-27)	0.4118
Elevated temps(>100.5) for > 48 hours	9(19)	5(10)	0.3864
Hospital mortality	0	1	0.99

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Related Donor Screening: An Increasingly Complex Process

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Allogeneic hematopoietic stem cell transplantation is being employed as a life-saving procedure for greater numbers of patients each year. Outpatient, reduced intensity transplants and haplo-matched transplants, recognition of limited efficacy for chemotherapy in high risk diseases, and extending the age limit for adults have all contributed to the growing numbers. As a consequence, the demand for donor screening resources has also increased. The National Marrow Donor Programs (NMDP) has published the Assessment Tool at Workup that has been recommended for use in determining eligibility of unrelated donors. In order to avoid the risk of bias in determining eligibility of related donors, the same criteria are being applied to them at many centers. As a referral center for complex transplants and increasing numbers of donors, we reviewed the outcomes of related donor screening and need for “additional” testing.

All donors were evaluated through a nurse practitioner-based clinic with physician backup. All donors were evaluated for bone marrow as well as peripheral blood donation regardless of the requested product. Sixty-two related potential donors were screened at MSKCC from February through September 2014. The median age was 48yrs and they were equally divided between males and females. Their demographics and outcomes are described in Table 1. Based on initial routine screening studies and utilizing the NMDP guidelines 15 donors (24%) were deemed eligible and cleared for donation; 6 were ineligible according to the NMDP guidelines for the following diagnoses: sickle cell trait, systemic lupus, multiple sclerosis, history of cervical cancer, babesiosis, and brain arteriovenous malformation. Forty-seven (76%) donors did not clear initially and 45 required additional evaluation based on ≥ 1 abnormalities (Table 2). These may have included laboratory or imaging studies, informal or formal subspecialty consultation or “other studies” such as bone marrow procedure. Notably only 1/14 foreign born donors cleared following initial evaluation. Forty-four (71%) donors actually donated, 4 of whom were deemed ineligible but were used. In all but 13 cases, the additional testing led to clearance.

Table 1
Donor Demographics and Outcomes

	Initial Clearance N=15		Not Initially Cleared N=47	
Males	8	53%	23	49%
Age median (range)	47 (22-66)		49 (20-72)	
Family				
Single Donor Family	14	93%	38	81%
Multi Donor Family	1	7%	9	19%
Type				
Haplo-identical	3	20%	11	23%
Identical	12	80%	36	77%
Foreign Born	1	7%	13	28%
Donated				
Yes	13	87%	31	66%
Ineligible but donated	0		4	
Ineligible for PBSC	1		2	
No	2	13%	16	34%
Ineligible & Deferred	0		7	
More suitable donor	2		2	
Recipient delay	0		3	
Incomplete clearance	0		2	
Change in protocol	0		1	
Lab abnormalities	0		1	
Product				
PBSC	4	31%	25	81%
BM	2	15%	4	13%
MD requested	1		2	
Per NMDP	1		2	
Lymphocytes	6	46%	1	3%
Combination	1 (PB and BM)	8%	1 (PB and Lymph)	3%
End Eligibility				
Eligible and donated	13	87%	27	57%
Ineligible and donated	0		4	9%
Eligible and did not donate	2	13%	5	11%
Ineligible and did not donate	0		8	17%
Incomplete Eligibility	0		3	6%

Abbreviations: PBSC – Peripheral Blood Stem Cells; BM – Bone Marrow

Table 2
Additional Evaluations

	Abnormal	Consult	Further Testing
EKG	15	13	3
Pits	5	5	4
LFTs	15	10	9
X-Ray	2	2	1
Urinalysis	10	4	8
Other	8		

Abbreviations: EKG – Electrocardiogram; Pits – Platelets, LFTs – Liver Function Tests, Neuro – Neurology

Conclusions: 1) The process of donor clearance has become more complex and resource demanding. 2) Care should be taken in selecting donors for screening to avoid unnecessary added costs to the transplant.

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Recurrent Late Cytomegalovirus Disease after Hematopoietic Cell Transplantation (HCT): Incidence, Clinical Manifestations, Risk Factors and Outcome

Sezen Özkök [1], *Hu Xie* [1], *Zach Stednick* [2], *Sachiko Seo* [2], *Michael J. Boeckh* [1,3], *Margaret L. Green* [1,3]. [1] *Fred Hutchinson Cancer Research Center, Seattle, WA;* [2] *Vaccine and Infectious Disease Division, Fred Hutchinson Cancer Research Center, Seattle, WA;* [3] *University of Washington, Seattle, WA*

Background: Late cytomegalovirus (CMV) disease occurs in about 6% of patients (R+ or D+/R-) who survive the first three months after HCT. We have previously identified steroid treatment after day 100 and CMV viremia before and after day 100 as risk factors for late CMV disease. Little is known, however, about the epidemiology and risk factors of recurrent late CMV disease. The objectives of this study were to describe the incidence, clinical characteristics, outcome, and risk factors for the development of recurrent late CMV disease.

Methods: We retrospectively analyzed medical records of 117 HCT patients, who developed CMV disease more than 100 days after their first allogeneic HCT between 2001 and 2011.We evaluated all CMV disease events occurring between the first late CMV disease and 2 years after HCT. Late CMV disease was considered recurrent if it occurred at least 6 weeks after the first late CMV disease.

Results: Among 117 patients with late CMV disease, 31 (26%) patients died within 6 weeks of diagnosis. Twelve of the eighty-six (14%) surviving patients developed a second late CMV disease event. Nine (75%) of the second late CMV disease cases were observed in the same organ, while three (25%) occurred in a different organ. There were 6 (50%) cases of gastrointestinal (GI) disease, 5 (42%) cases of pneumonia, and 1 (8%) episode of retinitis. Second late CMV disease episodes occurred at a median of 147 days [range 52-351] after the first late CMV disease and 374 days [range 212-679] after HCT. In addition, there were 4 cases of third late CMV disease (3 pneumonia and 1 GI).

All of the patients were receiving systemic immunosuppressive therapies at the time they developed recurrent late CMV disease. Nine of these twelve patients were undergoing weekly surveillance for viremia by PCR testing after their first late CMV disease event. Two patients developed CMV disease while receiving preemptive therapy for viremia. Three patients had low-level viremia below the threshold for starting treatment. However, four (33%) of the recurrent late CMV disease events (2 pneumonia, 2 GI) developed in the absence of viremia.

Two (17%) of the 12 patients with recurrent late CMV disease died within 6 weeks of their diagnosis; one additional patient died shortly after developing a third episode of CMV disease, and the remaining 9 patients survived at least to two years after HCT.

Conclusions: These data demonstrate that recurrent late CMV disease is not a rare event after allogeneic HCT. Patients who remain on systemic immunosuppressive therapy after a first episode of late CMV disease seem to be at particularly high risk for recurrence. While preemptive treatment of viremia might prevent some of these events, one-third of the cases developed in the absence of viremia including 2 cases of CMV pneumonia. Further study is warranted to prevent the morbidity and mortality associated with this late complication of HCT.

TRANSPLANT DATA MANAGEMENT

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Justifying the Construction of a Flexible, Functional Hematopoietic Cell Transplant (HCT) Database, BRAIN

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